4. Long distance (transboundary) shipment

STEP II-b OF PROCESS IN FLOW CHART IN APPENDIX 2

Transboundary shipment of sterile insects has taken place on a regular basis since the SIT was first developed. The total number of sterile insects shipped was estimated in 2003 at over 960 billion in more than 12,000 shipments to 22 recipient countries from 50 sterile insect production facilities in 25 countries. During this period of almost 50 years, only one problem associated with shipping live sterile insects has been recorded. This is a recent case with non-irradiated screwworms that were shipped to different locations for release. Human error was the cause of this incident that could have been prevented if standard operation procedures had been observed (FAO/IAEA/USDA 2003). This single case shows that any system is subjected to failure and illustrates the importance of strict observance of standard operation procedures (SOPs) to mitigate the risk of hazards occurring. In almost half a century, and over 300 billion sterile pupae involving tephritid fruit fly pests (History of Transboundary Shipments of Sterile Tephritid Fruit Flies, see **Appendix 4**), no shipment of sterile insects has ever been rejected by national or international plant protection or regulatory authorities (Enkerlin and Quinlan 2004).

The risks from transboundary movement of sterile insects have been determined to be negligible (See **Appendix 5**) if procedures outlined in this guidance are followed. Some countries do not regulate shipment of sterile insects, others only require labelling and documentation, and still others are regulating sterile insects under their biological control measures. This guidance, in conjunction with ISPM No.3 (FAO 2005), will assist national authorities, factories or any other organization shipping sterile insects. This document will outline standard operation procedures to follow, thus helping to assure safe shipments while facilitating trade.

For long-distance shipment, pupae are typically carried by commercial airlines in a portion of the cargo hold where temperature and air pressure are held at "cabin" levels. For long distance

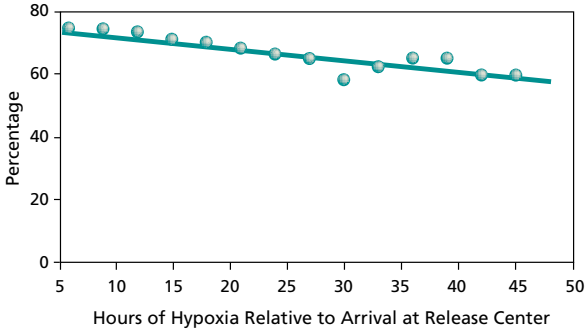

FIGURE 4.1
Detrimental effects on flight ability from prolonged hours in hypoxia

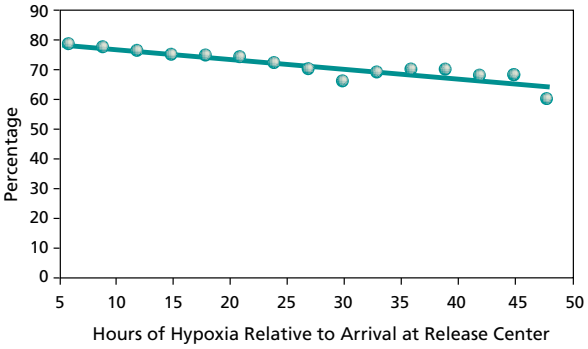

FIGURE 4.2
Detrimental effects on emergence from prolonged hours in hypoxia

shipments airline routing should be carefully selected to minimize transhipment points and overall shipment time. Although pupae have been held under hypoxia for 40 hours for some programmes, quality begins to drop rapidly when hypoxia extends beyond ≈24 hours. Use of plastic bottles rather than bags and boxes increases the negative effects of extended hypoxia on insect quality (**Figures 4.1 and 4.2**).

4.1 OPERATIONAL PROCEDURES (SEE ALSO SECTIONS 2 AND 3 OF THIS GUIDANCE)

4.2 NORMATIVE PROCEDURES

This section provides guidance for transboundary shipment and importation (either as a consignment in transit or for entry to the country of destination) of sterile insects for use in SIT control programmes of plant insect pests (see also Appendix 6). It covers shipment of sterile, mass reared insects, including those developed through traditional selection and mutation breeding.

It is suggested that the National Plant Protection Organization (NPPO) of each country designates the proper authority for assuring safe shipment of sterile insects (either through or to their territory). It is up to the NPPO to coordinate with the producer/shipper regarding their responsibilities for achieving safe shipment, because producers of sterile insects may be private businesses as well as government, parastatal, joint venture or internationally owned facilities.

4.2.1 Actions of the producer/shipper of the sterile insects

The producer/shipper may be the NPPO, a regional authority, a research centre, or a private organization. The recommended actions of the producer and shipper are:

Make sure that sterile insects conform to international accepted quality control standards and operation procedures (FAO/IAEA/USDA 2003), developed by the Joint FAO/IAEA Programme of Nuclear Techniques in Food and Agriculture, in cooperation with national governments, that offer years of experience in operating sterile insect production facilities and release programmes.

Take all necessary steps to ensure that exported sterile insects conform to relevant regulations of importing countries, especially concerning labelling and notification. Ensure that documentation includes instructions to handlers and officials at the point of entry on how the package should be treated. This will avoid damage to the contents and on action to be taken if the packaging is breached. Documentation should also indicate whether it may be opened for customs inspection. Arrangements with the shipping company should be done so that packages containing sterile pupae are placed in a way that they can be removed first from cargo to limit the time between arrival and receipt at the release centre.

Maintain contact with the FAO/IAEA Joint Programme to facilitate awareness of new developments in operation procedures available in guidance and manuals. Keep the Joint Division informed of any difficulties in compliance with the procedures or gaps in understanding of the procedures. The producer/shipper should give advance notice with full details of routing to the receiver to minimize delays and to alert officials at the point(s) of entry.

4.2.2 Actions of the authorities prior to export

The recommended actions of the authorities of the exporting country are:

- Certify that the shipment contains sterile insects that have been produced, sterilized and packed according to Manual for Product Quality Control and Shipping Procedures for Sterile Mass-Reared Tephritid Fruit Flies (FAO/IAEA/USDA 2003) or other procedures developed by the Joint FAO/IAEA Programme in cooperation with national and/or local governments.
- Verify that the shipment complies with the necessary documentation for safe transport.
- Issuance of Phytosanitary Certificate, issued under the authority of the NPPO in accordance with import requirements specified by the importing NPPO for the shipment may also be extended.

4.2.3 Actions of the authorities upon import (final or transit)

The recommended actions of the authorities of the importing country are:

- Make information available regarding the proper markings on packages to officials from any agency that may be a point of first contact with a diverted package of sterile insects so that it will be properly handled and notification will be made to the producer/shipper of the action taken.
- Seek to verify that the packages have not been breached, and/or there is living material spilled in or on the packages.
- Seek to verify the sterility of quarantine pests detected in regular surveillance, when the species detected is transiting or entering the country for use in SIT activities.
- Take phytosanitary action if an exotic contaminant species of quarantine concern is detected in or on the packaging of a consignment of sterile insects.
- If applicable, a pest risk analysis may be conducted to evaluate the additional risk and options for additional measures that may be considered.

4.2.4 The recommended actions of the importer

The importer may be the NPPO, a regional authority, a research centre, or a private organization. For the purposes of this manual, the primary responsibility of the importer regarding transboundary shipment is to notify the producer/shipper and appropriate authorities in the case of a missing or delayed arrival of a consignment of sterile insects to facilitate tracking the shipment and proper handling when located.

4.2.5 Shipping documents

It is recommended that packages be accompanied by the necessary documentation to guarantee timely and safe delivery. Shippers may be vigilant of the following:

- Documentation may conform: (i) to relevant regulations of exporting and importing countries, especially concerning import permit, national transit permit, phytosanitary certificate, irradiation certificate, labelling and notification, and (ii) to transit regulations should the shipment transit through a third country (i.e., a country that is neither the country of origin nor the country of destination of the consignment) (**Figure 4.3**).
- Documents may include clear instructions to handlers and officials at the point of embarkment, transhipment and entry on how the package should be treated to avoid damage to the contents and on action to be taken if the package is breached.

FIGURE 4.3.
"Transit" documents for shipment of sterile medfly pupae from Guatemala to Israel through the Netherlands

- The documentation may indicate that package content is perishable and therefore rapid transit of the material should be allowed.
- The receiver may have the necessary documentation to provide rapid feedback when the package is delayed.
- The receiver might request data on the quality of the sterile insects being reared.
- The receiver may request, for each consignment, a datasheet with a minimum of information as shown in **Appendix 3**.
- Documents may also include clear instructions to officials at transhipment or entry points on how a lost package that is found is to be discarded.

A recommended practice is to include a copy of the radiation certificate with each shipment placed inside box number 1 of the shipment.

4.2.6 Traceability

A system to trace the sterile insect shipments throughout the whole process is of primary importance. It is recommended that procedures to facilitate tracking of consignments described in section 3 be followed.

4.2.7 Recommended actions in case of non-compliance

Examples where phytosanitary actions by importing or transit NPPO's may be justified regarding non-compliance with import regulations include:

- Detection of a listed quarantine pest associated with sterile insect consignments for which it is regulated.
- Evidence of failure to meet prescribed requirements (including bilateral agreements or arrangements, or import permit conditions) such as treatment and laboratory tests.

- Interception of a consignment which does not otherwise comply with import regulations, such as detected presence of undeclared commodities, soil or some other prohibited article or evidence of failure of specified treatments.
- Invalid or missing required documentation.
- Prohibited consignments or articles.
- Failure to meet 'in-transit' measures.

Type of action will vary with circumstances and should be the minimum necessary to counter identified risk. Administrative errors such as incomplete required documentation may be resolved through liaison with production facility. Other infringements may require action such as:

Detention — This may be used if further information is required, taking into account need to avoid consignment damage as far as possible.

Destruction — Consignment may be destroyed in cases where NPPO considers consignment cannot be otherwise handled. If destruction is required it must be done at least under supervision of end user.

4.2.8 Recommended emergency action

Emergency action may be required by importing or transit countries in a new or unexpected phytosanitary situation, such as detection of quarantine pests or potential quarantine pests:

- In consignments for which phytosanitary measures are not specified.
- In regulated consignments or other regulated articles in which their presence is not anticipated and for which no measures have been specified.
- As contaminants of conveyances, storage places or other places involved with imported commodities.
- Emergency actions should result in destruction of consignment in cases where the authorities considers the consignment cannot be otherwise handled. If destruction is required it must be done at least under supervision of the end user.

4.2.9 Records

Records may be kept by the authorities of the exporting, transit and importing countries of all actions, results and decisions including:

- Records of inspection, sampling and testing.
- Non-compliance and emergency action (in accordance with ISPM No. 13: *Guidelines for the notification of non-compliance and emergency action*) (FAO 2001).

4.2.10 Communication

Producers and end users may want to ensure that there are communication procedures to contact:

- Producer/end user and appropriate industry representatives.
- National authorities (including NPPOs if applicable) of exporting/transit/importing countries.
- Have a list of contact numbers during and after hours.

4.3 REFERENCES CITED

Enkerlin, W.R., and M.M. Quinlan. 2004. Development of an international standard to facilitate the transboundary shipment of sterile insects, pp. 203–212. *In* Barnes, B. N. (Ed.) Proceedings, of the 6th International Symposium on Fruit Flies of Economic Importance, Isteg Scientific Publications, Irene, South Africa.

(FAO) Food and Agriculture Organization of the United Nations. 2001. Guidelines for the notification of non-compliance and emergency action. ISPM No. 13, Rome, Italy.

FAO/IAEA/USDA. 2003. Manual for product quality control and shipping procedures for sterile mass-reared tephritid fruit flies, Version 5.0. International Atomic Energy Agency. Vienna, Austria. 85 pp.

(FAO). 2005. Guidelines for the export, shipment, import and release of biological control agents and other beneficial organisms. ISPM No. 3, Rome, Italy.